

AMENDMENTS TO THE CLAIMS

1. (Currently amended) An address management apparatus for managing a network layer address and a data link layer address of a terminal connected to a network, said apparatus comprising:

data link layer address storage means for storing a data link layer address table showing the correspondences correspondence between data link layer addresses and network layer addresses;

data link layer address search means for searching the data link layer address table for so as to detect an unused data link layer address;

corresponding network layer address search means for searching the data link layer address table for so as to detect a network layer address corresponding to a specified data link layer address;

data link layer address assignment instruction means for transmitting a data link layer address assignment instruction which includes, as information, at least the unused data link layer address detected by the data link layer address search means[[],] to a terminal specified by the network layer address detected by the corresponding network layer address search means;

data link layer address updation means for updating the correspondence between the data link layer address and the network layer address on the data link layer address table[[],] according to the information of the data link layer address assignment instruction;

data link layer address assignment instruction detection means for detecting the data link layer address assignment instruction so as to obtain the data link layer address from the data link layer address assignment instruction[[],] in the terminal specified by the network layer address detected by the corresponding network layer address search means; and

data link layer address setting means for setting the data link layer address obtained by the data link layer address assignment instruction detection means[[],] in the self-terminal specified by the network layer address.

2. (Currently amended) The address management apparatus of claim 1, further comprising:
network layer address storage means for storing a network layer address table showing
the correspondences correspondence between network layer addresses and data link layer
addresses;

network layer address search means for searching the network layer address table for an
unused network layer address;

corresponding data link layer address search means for searching the network layer
address table for so as to detect a network layer address corresponding to a specified data link
layer address;

network layer address assignment request detection means for detecting a network layer
address assignment request including at least data link layer address information, which wherein
the network layer address assignment request is output from a terminal that needs to set a
network layer address;

address assignment instruction means for transmitting a network layer address assignment
instruction including, as information, the unused network layer address detected by the network
layer address search means[[,]] to the terminal which needs to set a network layer address[[,]]
when there is no network layer address detected by the corresponding data link layer address
search means;

network layer address updation means for updating the correspondence between the
network layer address and the data link layer address on the network layer address table[[,]]
according to the network layer address assignment instruction or the data link layer address
assignment instruction;

~~said data link layer address updation means for updating the correspondence between the
data link layer address and the network layer address on the data link layer address table,
according to the network layer address assignment instruction or the data link layer address
assignment instruction;~~

network layer address assignment request means for transmitting the network layer
address assignment request in the terminal which needs to set a network layer address;

network layer address assignment instruction detection means for detecting the network layer address assignment instruction, and extracting the network layer address from the network layer address assignment instruction; and

network layer address setting means for setting the network layer address extracted by the network layer address assignment instruction detection means[[,]] in the self-terminal which needs to set a network layer address;

wherein said data link layer address updation means updates the correspondence between the data link layer address and the network layer address on the data link layer address table according to the network layer address assignment instruction or the data link layer address assignment instruction:

wherein said corresponding network layer address search means searches the data link layer address table for a network layer address corresponding to the data link layer address in the network layer address assignment request information; and

wherein, when the network layer address searched by the corresponding network layer address search means exists in the data link layer address table, said data link layer address assignment instruction means transmits a data link layer address assignment instruction including, as information, at least the unused data link layer address detected by the data link layer address search means[[,]] to the terminal having the network layer address.

3. (Currently amended) The address management apparatus of claim 2, further comprising:

network layer address assignment request delay means for detecting, in the self-terminal specified by the network layer address, a network layer address assignment request directed to another terminal,

extracting a source data link layer address in the information of the detected network layer address assignment request, and

delaying transmission of a network layer address assignment request from the self terminal specified by the network layer address when the extracted data link layer address is

equal to the data link layer address of the self-terminal specified by the network layer address.

4. (Currently amended) The address management apparatus of claim 1, further comprising:
address detection means for detecting the correspondence between a data link layer address and a network layer address of a source of a transmission packet on the connected network, and the correspondence between a data link layer address and a network layer address of a destination of the transmission packet;

wherein said data link layer address updation means updates the correspondence between the data link layer address and the network layer address on the data link layer address table[[,]] according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected by the address detection means; and
said network layer address table updation means updates the correspondence between the data link layer address and the network layer address on the network layer address table[[,]] according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected by the address detection means.

5. (Currently amended) The address management apparatus of claim 2, further comprising:
address detection means for detecting the correspondence between a data link layer address and a network layer address of a source of a transmission packet on the connected network, and the correspondence between a data link layer address and a network layer address of a destination of the transmission packet;

wherein said data link layer address updation means updates the correspondence between the data link layer address and the network layer address on the data link layer address table[[,]] according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected by the address detection means; and

said network layer address table updation means updates the correspondence between the data link layer address and the network layer address on the network layer address table[.,.] according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected by the address detection means.

6. (Currently amended) An address management method for managing a network layer address and a data link layer address of a terminal connected to a network, said method comprising:

a data link layer address storage step operation of storing a data link layer address table showing the correspondences correspondence between data link layer addresses and network layer addresses;

a data link layer address search step operation of searching the data link layer address table for so as to detect an unused data link layer address;

a corresponding network layer address search step operation of searching the data link layer address table for so as to detect a network layer address corresponding to a specified data link layer address;

a data link layer address assignment instruction step operation of transmitting a data link layer address assignment instruction which includes, as information, at least the unused data link layer address detected in the data link layer address search step operation[.,.] to a terminal specified by the network layer address detected in the corresponding network layer address search step operation;

a data link layer address updation step operation of updating the correspondence between the data link layer address and the network layer address on the data link layer address table[.,.] according to the information of the data link layer address assignment instruction;

a data link layer address assignment instruction detection step operation of detecting the data link layer address assignment instruction so as to obtain the data link layer address from the

data link layer address assignment instruction, in the terminal specified by the network layer address detected in the corresponding network layer address search step operation; and

a data link layer address setting step operation of setting the data link layer address obtained in the data link layer address assignment instruction detection step operation[[,]] in the self terminal specified by the network layer address.

7. (Currently amended) The address management method of claim 6, further comprising:

a network layer address storage step operation of storing a network layer address table showing the correspondences correspondence between network layer addresses and data link layer addresses;

a network layer address search step operation of searching the network layer address table for so as to detect an unused network layer address;

a corresponding data link layer address search step operation of searching the network layer address table for so as to detect a network layer address corresponding to a specified data link layer address;

a network layer address assignment request detection step operation of detecting a network layer address assignment request including at least data link layer address information, which wherein the network layer address assignment request is transmitted by a terminal that needs to set a network layer address;

an address assignment instruction step operation of transmitting a network layer address assignment instruction including, as information, the unused network layer address detected in the network layer address search step operation[[,]] to the terminal which needs to set a network layer address[[,]] when no network layer address is detected in the corresponding data link layer address search step operation;

a network layer address updation step operation of updating the correspondence between the network layer address and the data link layer address on the network layer address table[[,]] according to the network layer address assignment instruction or the data link layer address assignment instruction;

said data link layer address updatation step operation of updating the correspondence between the data link layer address and the network layer address on the data link layer address table, according to the network layer address assignment instruction or the data link layer address assignment instruction;

a network layer address assignment request step operation of transmitting the network layer address assignment request in the terminal which needs to set a network layer address;

a network layer address assignment instruction detection step operation of detecting the network layer address assignment instruction, and extracting the network layer address from the network layer address assignment instruction; and

a network layer address setting step operation of setting the network layer address extracted in the network layer address assignment instruction detection step operation[[,]] in the self-terminal which needs to set a network layer address;

wherein said data link layer address updatation operation updates the correspondence between the data link layer address and the network layer address on the data link layer address table according to the network layer address assignment instruction or the data link layer address assignment instruction;

wherein, in said corresponding network layer address search step operation, the data link layer address table is searched for a network layer address corresponding to the data link layer address in the network layer address assignment request information; and

wherein, when the network layer address searched by for in said corresponding network layer address search step operation exists in the data link layer address table, in said data link layer address assignment instruction step operation, a data link layer address assignment instruction including, as information, at least the unused data link layer detected in the data link layer address search step operation[[,]] is transmitted to the terminal having the network layer address.

8. (Currently amended) The address management method of claim 7, further comprising:

a network layer address assignment request delay step operation of detecting, in the self terminal specified by the network layer address, a network layer address assignment request directed to another terminal,

extracting a source data link layer address in the information of the detected network layer address assignment request, and

delaying transmission of a network layer address assignment request from the self terminal specified by the network layer address when the extracted data link layer address is equal to the data link layer address of the self terminal specified by the network layer address.

9. (Currently amended) The address management method of claim 6, further comprising:

an address detection step operation of detecting the correspondence between a data link layer address and a network layer address of a source of a transmission packet on the connected network, and the correspondence between a data link layer address and a network layer address of a destination of the transmission packet;

wherein, in said data link layer address updation step operation, the correspondence between the data link layer address and the network layer address on the data link layer address table is updated according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected in the address detection step operation; and

in said network layer address table updation step operation, the correspondence between the data link layer address and the network layer address on the network layer address table is updated according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected in the address detection step operation.

10. (Currently amended) The address management method of claim 7, further comprising:

an address detection step operation of detecting the correspondence between a data link layer address and a network layer address of a source of a transmission packet on the connected network, and the correspondence between a data link layer address and a network layer address of a destination of the transmission packet;

wherein, in said data link layer address updation step operation, the correspondence between the data link layer address and the network layer address on the data link layer address table is updated according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected in the address detection step operation; and

in said network layer address table updation step operation, the correspondence between the data link layer address and the network layer address on the network layer address table is updated according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected in the address detection step operation.

11. (New) An address management apparatus for managing a network layer address and a data link layer address of a terminal connected to a network, said apparatus comprising:

a data link layer address storage unit for storing a data link layer address table showing the correspondence between data link layer addresses and network layer addresses;

a data link layer address search unit operable for searching the data link layer address table so as to detect an unused data link layer address;

a corresponding network layer address search unit for searching the data link layer address table so as to detect a network layer address corresponding to a specified data link layer address;

a data link layer address assignment instruction unit for transmitting a data link layer address assignment instruction which includes, as information, at least the unused data link layer address;

address detected by said data link layer address search unit to a terminal specified by the network layer address detected by said corresponding network layer address search unit;

a data link layer address updating unit for updating the correspondence between the data link layer address and the network layer address on the data link layer address table according to the information of the data link layer address assignment instruction;

a data link layer address assignment instruction detection unit for detecting the data link layer address assignment instruction so as to obtain the data link layer address from the data link layer address assignment instruction in the terminal specified by the network layer address detected by said corresponding network layer address search unit; and

a data link layer address setting unit for setting the data link layer address obtained by said data link layer address assignment instruction detection unit in the terminal specified by the network layer address.

12. (New) The address management apparatus of claim 11, further comprising:

a network layer address storage unit for storing a network layer address table showing the correspondence between network layer addresses and data link layer addresses;

a network layer address search unit for searching the network layer address table for an unused network layer address;

a corresponding data link layer address search unit for searching the network layer address table so as to detect a network layer address corresponding to a specified data link layer address;

a network layer address assignment request detection unit for detecting a network layer address assignment request including at least data link layer address information, wherein the network layer address assignment request is output from a terminal that needs to set a network layer address;

an address assignment instruction unit for transmitting a network layer address assignment instruction including, as information, the unused network layer address detected by said network layer address search unit to the terminal which needs to set a network layer address

when said corresponding data link layer address search unit does not detect a network layer address;

a network layer address updating unit for updating the correspondence between the network layer address and the data link layer address on the network layer address table according to the network layer address assignment instruction or the data link layer address assignment instruction;

a network layer address assignment request unit for transmitting the network layer address assignment request in the terminal which needs to set a network layer address;

a network layer address assignment instruction detection unit for detecting the network layer address assignment instruction, and for extracting the network layer address from the network layer address assignment instruction; and

a network layer address setting unit for setting the network layer address extracted by said network layer address assignment instruction detection unit in the terminal which needs to set a network layer address;

wherein said data link layer address updating unit updates the correspondence between the data link layer address and the network layer address on the data link layer address table according to the network layer address assignment instruction or the data link layer address assignment instruction;

wherein said corresponding network layer address search unit searches the data link layer address table for a network layer address corresponding to the data link layer address in the network layer address assignment request information; and

wherein said data link layer address assignment instruction unit transmits a data link layer address assignment instruction including, as information, at least the unused data link layer address detected by said data link layer address search unit to the terminal having the network layer address when the network layer address searched by said corresponding network layer address search unit exists in the data link layer address table.

13. (New) The address management apparatus of claim 12, further comprising a network layer address assignment request delay unit for:

detecting, in the terminal specified by the network layer address, a network layer address assignment request directed to another terminal;

extracting a source data link layer address in the information of the detected network layer address assignment request; and

delaying transmission of a network layer address assignment request from the terminal specified by the network layer address when the extracted data link layer address is equal to the data link layer address of the terminal specified by the network layer address.

14. (New) The address management apparatus of claim 11, further comprising:

an address detection unit for detecting the correspondence between a data link layer address and a network layer address of a source of a transmission packet on the connected network, and the correspondence between a data link layer address and a network layer address of a destination of the transmission packet;

wherein said data link layer address updating unit updates the correspondence between the data link layer address and the network layer address on the data link layer address table according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected by said address detection unit; and

said network layer address table updating unit updates the correspondence between the data link layer address and the network layer address on the network layer address table according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected by said address detection unit.

15. (New) The address management apparatus of claim 12, further comprising:

an address detection unit for detecting the correspondence between a data link layer address and a network layer address of a source of a transmission packet on the connected network, and the correspondence between a data link layer address and a network layer address of a destination of the transmission packet;

wherein said data link layer address updating unit updates the correspondence between the data link layer address and the network layer address on the data link layer address table according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected by said address detection unit; and

said network layer address table updating unit updates the correspondence between the data link layer address and the network layer address on the network layer address table according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected by said address detection unit.